

CLAIMS

1. A method for measuring stress forces in refiners having refining discs that between them define a refining gap for refining refining material between bars (3) arranged on the refining discs, the measuring being performed over a measuring surface (2) that constitutes a part of a refining disc, and said measuring surface comprising at least parts of more than one bar (3) and being resiliently arranged in the surface of the refining disc, **characterized in** that forces directed perpendicularly to the measuring surface are measured.

10 2. A method as claimed in claim 1, **characterized in** that the measurement of forces directed perpendicularly to the measuring surface comprises measuring the normal force exerted by a combined pressure consisting of the steam pressure existing at the measuring surface and the fibre pressure exerted by the refining material.

15 3. A method as claimed in claim 1, **characterized in** that the measurement of forces directed perpendicularly to the measuring surface comprises measuring the normal force exerted by only the fibre pressure of the refining material, since compensation is made for the steam pressure existing at the measuring surface.

20 4. A method as claimed in claim 3, **characterized in** that the temperature of the steam at the measuring surface is measured and that the steam pressure at the measuring surface is calculated on the basis of this temperature, compensation thus being obtained for the steam pressure so that the normal force exerted by only the fibre pressure of the refining material is measured.

25 5. A method as claimed in claim 3, **characterized in** that the measurement of said normal force is performed with the aid of force sensors (32; 33, 34) arranged in connection with the measuring surface (2) and in that the steam pressure is permitted to influence said sensors from two directions, both at the measuring surface in the refiner and also from the opposite direction, compensation for the steam pressure thus being obtained so that only the normal force exerted by the fibre pressure of the refining material is measured.

6. A measuring device for measuring stress forces in refiners having refining discs that between them define a refining gap for refining refining material between bars (3) arranged on the refining discs, which measuring device comprises members for measuring the stress force over a measuring surface (2) that constitutes a part of a refining disc, said measuring surface comprising at least parts of more than one bar (3) and being resiliently arranged in the surface of the refining disc, **characterized in** that said members for measuring the stress force over a measuring surface comprise means (32; 33, 34) measuring forces directed perpendicularly to the measuring surface.
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7. A measuring device as claimed in claim 6, **characterized in** that the measuring surface is movably arranged at right angles to the measuring surface, and in that said members for measuring forces directed perpendicularly to the measuring surface comprise at least two force sensors (32; 33, 34), connected to the measuring surface via a body (5).
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8. A measuring device as claimed in claim 7, **characterized in** that the force sensors (32; 33, 34) are arranged so that they give counter-directed readings when the measuring surface is influenced by the stress force.
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9. A measuring device as claimed in any one of claims 6-8, **characterized in** that said members for measuring perpendicular forces measure the normal force exerted by a combined pressure consisting of the steam pressure existing at the measuring surface and the fibre pressure exerted by the refining material.
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10. A measuring device as claimed in any one of claims 6-8, **characterized in** that said members for measuring perpendicular forces measure a normal force consisting of only the fibre pressure exerted by the refining material, since the measuring device also includes a device for compensating for the steam pressure existing at the measuring surface.
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11. A measuring device as claimed in claim 10, **characterized in** that the device for compensating steam pressure comprises means for measuring the tem-

perature of the steam at the measuring surface, the steam pressure at the measuring surface thus being calculated on the basis of this temperature, thereby enabling compensation to be obtained for the steam pressure so that the normal force exerted by only the fibre pressure of the refining material is measured.

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12. A measuring device as claimed in claim 10, **characterized** in that it comprises an equalizing connection (13) for the steam pressure so that said means (32; 33, 34) for measuring perpendicular forces is influenced by the steam pressure from two counter-directed directions, both at the measuring surface in the refining and also from the opposite direction, so that compensation is obtained for the steam pressure and the normal force measured relates only to the fibre pressure.

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13. A measuring device as claimed in any one of claims 6-12, **characterized** in that said members for measuring perpendicular forces comprise at least two plate-shaped force sensors.

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14. A measuring device as claimed in any one of claims 6-12, **characterized** in that said force sensors comprise strain gauges.

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15. A measuring device as claimed in any one of claims 6-12, **characterized** in that said force sensors comprise piezo-electric transducers.

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